WATER SENSITIVE URBAN DESIGN **RAINGARDENS**

HORNSBY SHIRE COUNCIL

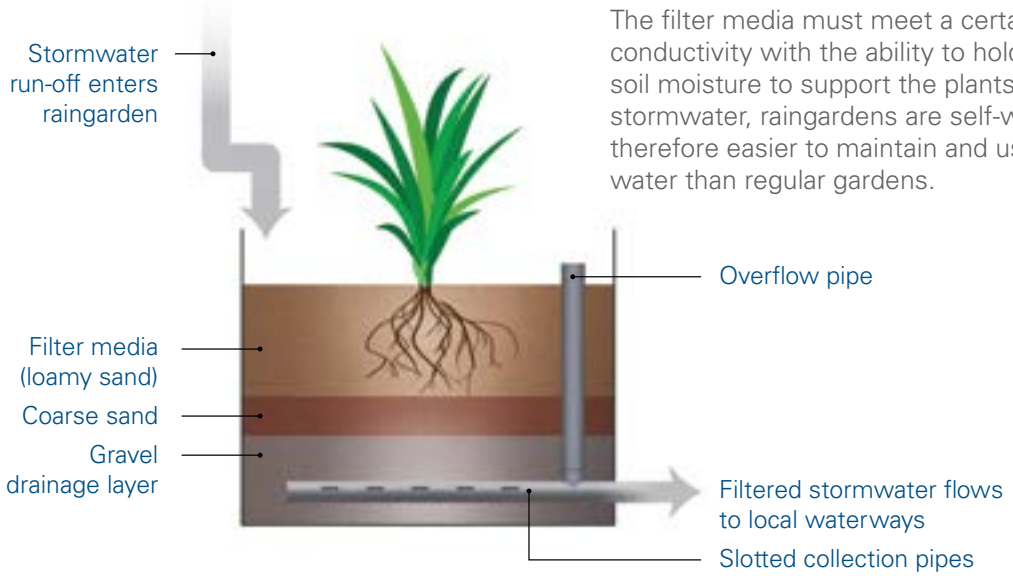
> "Raingardens are self-watering, low maintenance gardens designed to protect our creeks and rivers by capturing stormwater which runs off hard surfaces after it rains."

Water Sensitive Urban Design (WSUD) seeks to minimise the extent of impervious surfaces and thereby slow stormwater runoff to gain natural filtration, on-site detention and infiltration. It offers an alternative to the traditional transport-by-pipe approach to stormwater management.

TRAPPING STORMWATER POLLUTANTS

Stormwater run-off generally undergoes three treatment processes within a raingarden:

1. Capture of litter, sediment and large pollutants on the surface of the garden
2. Removal of small and fine pollutants by filtration
3. Chemical and biological uptake of dissolved pollutants via soil, plants, roots, biofilms and microbes.



HOW DO RAINGARDENS WORK?

The surface traps litter, leaves and sediment whilst the soil filter media (in combination with the plants root system) helps to filter and breakdown microscopic pollutants such as nutrients, heavy metals and hydrocarbons.

Rain gardens are designed to filter pollutants from frequent low intensity showers (catering for 95% of all stormwater runoff). The traditional drainage system (stormwater pits and pipes) are still required to cater for larger infrequent storm events to prevent localised flooding.

Stormwater run-off is directed into the raingarden where it ideally disperses evenly over its surface maximising the volume of run-off to be treated. Native grasses, shrubs and trees are densely planted and selected on their capacity to absorb pollutants and tolerate inundation and extended dry periods.

The run-off is filtered as it percolates through a layered filter media profile (see Figure 1.) comprising up to a metre of loamy sand, a coarse sand transition layer and a gravel drainage layer inset with slotted drainage pipes to collect the filtered water and direct it into the stormwater drainage system or downstream to local waterways.

Nutrients dissolved in the stormwater are used by the plants and toxins stick to the soil. The soil and plant roots work together to naturally filter the water and remove pollutants.

The filter media must meet a certain level of hydraulic conductivity with the ability to hold adequate soil moisture to support the plants. By capturing stormwater, raingardens are self-watering and are therefore easier to maintain and use less mains drinking water than regular gardens.

*Stormwater run-off carries with it a range of pollutants – including litter, cigarette butts, fertilisers, dog poo, chemicals, tyre rubber, heavy metals and sediment which washes from our roads, roofs, properties, parks, gardens and footpaths into stormwater drains and affects the health of local creeks, rivers and estuaries.

WHAT IS A RAINGARDEN?

A raingarden (also known as a biofilter or bioretention basin) is a vegetated sand filter designed to stop excess stormwater, nutrients, rubbish and sediment from polluting local waterways. Similar to a regular garden bed, a raingarden specifically captures and filters stormwater runoff from hard (impervious) surfaces such as roofs, roads, footpaths, car parks or driveways after it rains.

The main pollutants captured by raingardens are suspended solids, metals and nutrients including Nitrogen and Phosphorus compounds which are highly damaging to receiving aquatic and riparian ecosystems.

Using a specially prepared soil and sand filter media and planted with a combination of plants a raingarden reduces the amount of stormwater that would otherwise wash pollutants into the stormwater system and receiving waterbodies.

Raingardens can be used to encourage infiltration and groundwater recharge or simply to filter run-off before it enters a local watercourse or stormwater drainage system.

Benefits of Raingardens

- Self-watering and easy to maintain.
- Water saving, especially if planted with native drought tolerant plants.
- Helps to filter polluted stormwater run-off before it enters local waterways.
- Slows the flow and reduces the volume of stormwater run-off.
- Contributes to reducing the peak rate of flood flows downstream.
- Provides habitat and contributes to healthy waterways.

What can I do?

- Construct your own raingarden - smart landscape design slows the flow of stormwater run-off.
- Use rainwater tanks, down pipe diversions, swales and raingardens (e.g. inground, infiltration, planter box or vegetable-type raingardens) to capture water before it leaves your property.
- Implement landscaping and drainage elements that ensure sediments, leaves, grass clippings and nutrients no longer leave your property.
- Reduce or eliminate the use of water soluble fertilisers on your property as these cause algal blooms in waterways.
- Where paving is necessary choose permeable or porous paving options.

FURTHER INFORMATION:

Melbourne Water
www.melbournewater.com.au/getinvolved/protecttheenvironment/raingardens/Pages/What-is-a-raingarden.aspx

Cooks River Alliance
www.cooksriver.org.au/publications/build-your-own-raingarden/

Healthy Waterways
www.healthywaterways.org/getinvolved/help/raingarden